## REMARKS

This response responds to the Office Action dated July 22, 2003 in which the Examiner rejected claims 6-10, 17 and 20-23 under 35 U.S.C. § 102(e), rejected claims 11-16 under 35 U.S.C. § 103 and objected to claims 18-19 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form.

Claim 6 claims an image pick-up device comprising a sensor, a setting unit, and a correction unit. The sensor picks up an image through a lens. The setting unit sets chromatic aberration factors based on the image data picked up from a predetermined pattern. The correction unit corrects image data picked up from an original image by using the chromatic aberration factors set by the setting unit.

Through the structure of the claimed invention having a correction unit which corrects image data picked up from an original image as claimed in claim 6, the claimed invention provides an image pickup device which can output stable color image information signals which are not influenced by chromatic aberration. The prior art does not show, teach or suggest the invention as claimed in claim 6.

Claim 11 claims an image pick-up device comprising a sensor, a pattern image, a calculation unit, a memory and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern. The calculation unit calculates chromatic aberration factors based on the image data picked up from the pattern image. The memory stores the calculated chromatic aberration factors. The correction unit corrects image data picked up from an original image based on the stored chromatic aberration factors.

Through the structure of the claimed invention having a correction unit which corrects image data picked up from an original image as claimed in claim 11, the claimed invention provides an image pick-up device which can output stable color image information which is not influenced by chromatic aberrations. The prior art does not show, teach or suggest the invention as claimed in claim 11.

Claim 17 claims an image pick-up device comprising a sensor, a pattern image, a determining unit, a setting unit and a correction unit. The sensor picks up an image through a lens. The pattern image has a predetermined pattern. The determining unit determines a character amount of the image data picked up from the pattern image. The setting unit sets chromatic aberration factors based on the character amount. The correction unit corrects image data picked up from an original image by using the chromatic aberration factors set by the setting unit.

Through the structure of the claimed invention having a correction unit which corrects image data picked up from an original image as claimed in claim 17, the claimed invention provides an image pick-up device which can output a stable color image information signal which is not influenced by chromatic aberration. The prior art does not show, teach or suggest the invention as claimed in claim 17.

Claims 6-10, 17 and 22-23 were rejected under 35 U.S.C. § 102(e) as being anticipated by *Hyodo* (U.S. Patent No. 6,219,463).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. § 102(e). The claims have been reviewed in light of the Office Action, and for

reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to the claims and allows the claims to issue.

*Hyodo* appears to disclose an image reading device including a reading optical system which is able to read an image with a variable magnification. (Col. 1, lines 9-11) The magnification ratio detecting device detects the actual projection magnification ratio by the projecting device, and the sub-scanning travel speed controlling device controls the sub-scanning speed of the moving device in the sub-scanning direction to the sub-scanning speed corresponding to the projection magnification ratio. (Col. 1, lines 60-65) The zoom lens 25 projects an image on the CCD 26 on a reduced scale. (Col. 7, lines 34-35) An image signal processor 16 for processing an image signal from the CCD 26 and an MPU (Micro Processing Unit) 17 which exchanges a signal with the image signal processor 16. (Col. 7, lines 49-52) The lens unit moving motor rotation amount calculating section 201 calculates the amount of rotation of the lens unit moving motor ML. The zooming amount calculating section 202 calculates the amount of zooming of the zoom lens 25 according to a designated magnification ratio. The sub-scanning speed calculating section 203 calculates the sub-scanning speed according to the designated magnification ratio. (Col. 8, lines 3-10) Next, at a command from the MPU 17, the image signal processor 16 executes magnification ratio checking (step S2) and executes shading correction and gain adjustment, thereby effecting correction so that no influence is exerted from a light quantity distribution variation within the reading angle of view due to a change in the reading range (step S3 in FIG. 7). (Col. 10, lines 24-30) That is, an image signal of the image obtained by projecting on the CCD 26 the line marks A, B and C which are formed at specified

intervals and owned by the line pattern 3a of the reference pattern 3 by means of the zoom lens 25 is transmitted from the image signal processor 16 to the MPU 17. The MPU 17 detects an edge portion of the projection image and obtains a distance between edges of the read line pattern 3a from the edge portion of the projection image. Then, the MPU 17 calculates the actual reading magnification ratio by comparing the read distance between edges of the line pattern 3a to the measured values of the distances between the known line marks A, B and C. Then, the MPU 17 transmits the calculated actual reading magnification ratio as a magnification ratio signal to the scanning controller 13, and the sub-scanning speed calculating section 203 of this scanning controller 13 calculates a sub-scanning speed corresponding to the actual reading magnification ratio. Then, the sub-scanning motor M1 is driven by this calculated sub-scanning speed. Therefore, according to the present embodiment, the sub-scanning speed corresponding to the actual projection magnification ratio can be set regardless of the presence or absence of the magnification ratio error attributed to the mechanical error on the lens side in the zooming stage, so that the disorder of the aspect ratio of the pixels can be prevented, thereby allowing an accurate image to be obtained. In this stage, a ladder pattern 3b of the reference pattern 3 shown in FIG. 9 is read, MTF (Modulation Transfer Function) is calculated from the result of reading this ladder pattern 3b and it is checked whether or not irregular defocusing of the lens system is occurring. (Col. 10, line 46 through Col. 11, line 9) By executing the shading correction and gain adjustment as described above, the uniformity of the reading image quality can be maintained even when the illumination condition viewed from the CCD 26 side is significantly varied due to the arbitrary

designation of the reading area A1 and the reading magnification ratio as stated before. (Col. 11, lines 20-25) By the operations of step S1 through step S3, image deteriorating factors due to the MTF characteristic of the lens and the magnification ratio chromatic aberration can be brought into advantageous conditions within a range which can be set. That is, the optical axis of the zoom lens 25 can be made to coincide with the center position P2 of the set reading area A1 shown in FIG. 4 by the operation of step S1. Therefore, the zoom lens 25 can be used at a small angle of view, and the original document 1 can be regarded as symmetrical about the optical axis of the lens in the direction of the angle of view. Therefore, as shown in FIG. 5, the MTF characteristic of the lens which varies according to the image height and has a tendency of reducing as it deviates from the axis can be set approximately at maximum. Furthermore, as shown in FIG. 6, the amount of occurrence of the magnification ratio chromatic aberration generally increases as it deviates from the axis, and when this amount of occurrence exceeds a specified rate with respect to the reading pixel size, it causes a color shift. Therefore, by reducing the image height as far as possible, the magnification ratio chromatic aberration can be made small to allow the image quality to be controlled in a more stable state. Furthermore, as stated before, in regard to the sub-scanning speed of the image, the actual projection magnification ratio is detected from the image obtained by projecting on the CCD 26 the reference mark for detecting the magnification ratio, i.e., the reference pattern 3 shown in FIG. 9, and the sub-scanning speed is determined on the basis of this detected actual projection magnification ratio. (Col. 11, lines 31-60)

Thus, *Hyodo* merely discloses reducing an image height in order to make the magnification ratio chromatic aberration as small as possible (column 11, lines 46-52). Nothing in *Hyodo* shows, teaches or suggests correcting image data picked up from an original image as claimed in claims 6 and 17. Rather, *Hyodo* merely discloses reducing image height in order to make a magnification ratio chromatic aberration as small as possible (i.e., *Hyodo* controls the magnification and does not correct image data).

Additionally, *Hyodo* merely discloses detecting the actual projection magnification ratio in order to control the sub-scanning speed which corresponds to the projection magnification ratio. Nothing in *Hyodo* shows, teaches or suggests correcting image data which is picked up based upon chromatic aberration factors stored in a setting unit as claimed in claims 6 and 17. Rather, *Hyodo* merely discloses detecting the actual projection magnification ratio and then controlling the sub-scanning speed corresponding to the projection magnification ratio (column 1, lines 60-65, column 11, lines 53-59). In other words, once the magnification ratio is determined in *Hyodo*, it is used to correct the zoom of the lens. *Hyodo* does not correct image data picked up from the original image using chromatic aberration factors as claimed in claims 6 and 17.

Since nothing in *Hyodo* shows, teaches or suggests a correction unit which corrects image data picked up from an original image as claimed in claims 6 and 17, it is respectfully requested that the Examiner withdraws the rejection to claims 6 and 17 under 35 U.S.C. § 102(e).

Claims 7-10 and 20-23 depend from claims 6 and 17 and recite additional features. It is respectfully submitted that claims 7-10 and 20-23 would not have been anticipated by

*Hyodo* within the meaning of 35 U.S.C. § 102(e) at least for the reasons as set forth above. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claims 7-10 and 20-23 under 35 U.S.C. § 102(e).

Claims 11-16 were rejected under 35 U.S.C. § 103 as being unpatentable over *Hyodo* in view of *Dischert et al.* (U.S. Publication 2001/0030697).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. § 103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, it is respectfully requested that the Examiner withdraws the rejection to the claims and allows the claims to issue.

As discussed above, *Hyodo* merely discloses reducing a magnification ratio chromatic aberration by reducing the image height and in particular controls a sub-scanning speed based on the detected projection magnification ratio. Thus, nothing in *Hyodo* shows, teaches or suggests a correction unit which corrects image data picked up from an original image based on stored chromatic aberration factors as claimed in claim 11. Rather, *Hyodo* teaches away from the claimed invention and merely controls a sub-scanning speed based upon actual detected projection magnification ratios.

*Dischert et al.* appears to disclose color television cameras in general and specifically to a system for detecting and measuring chromatic aberration errors and linear registration errors in video images having live video content. [0001] An exemplary edge measurement and processing system is shown in FIG. 1. Red, green and blue video signals (RGBIN) are provided by a video camera to edge identification processor 110 and to an interpolator 118. The exemplary edge identification processor 110 scans the entire image

for edge information. When an edge is identified, sample representing pixels surrounding the edge in the horizontal direction are provided to a memory 114. A microprocessor 112 analyzes the stored samples and identifies those sets of samples which may correspond to misaligned vertical edges (horizontal transitions) in the red, green, and blue video signals. Using these identified edges, the microprocessor 112 generates correction waveforms and stores coefficients representing these waveforms in a correction memory 116. The interpolator 118 extracts the correction waveform coefficients from the memory 116 and applies correction waveforms to the red and blue color signals to align them with the green color signal. The output signals, RGBOUT, provided by the exemplary interpolator 118 are horizontally registered red, green, and blue color signals. [0020]

Thus, *Dischert et al.* merely discloses storing pixel data into a memory 114. Nothing in *Dischert et al.* shows, teaches or suggests a) a calculation unit which calculates chromatic aberration factors, and b) a memory which stores the calculated chromatic aberration factors as claimed in claim 11. Rather, *Dischert et al.* merely discloses storing samples representing pixels surrounding an edge into a memory.

Additionally, nothing in *Dischert et al.* shows, teaches or suggests a correction unit which corrects image data picked up from an original image based upon the stored chromatic aberration factors as claimed in claim 11.

Since nothing in *Hyodo* or *Dischert et al.* shows, teaches or suggests calculating chromatic aberration factors, storing the calculated chromatic aberration factors and correcting image data picked up from an original image based upon the stored chromatic

aberration factors as claimed in claim 11, it is respectfully requested that the Examiner withdraws the rejection to claim 11 under 35 U.S.C. § 103.

Claims 12-16 depend from claim 11 and recite additional features. It is respectfully submitted that claims 12-16 would not have been obvious within the meaning of 35 U.S.C. § 103 over *Hyodo* and *Dischert et al.* at least for the reasons as set forth above. Therefore, it is respectfully requested that the Examiner withdraws the rejection to claims 12-16 under 35 U.S.C. § 103.

Since objected claims 18-19 depend from allowable claims, it is respectfully requested that the Examiner withdraws the objection thereto.

The prior art of record, which is not relied upon, is acknowledged. The references taken singularly or in combination do not anticipate or make obvious the claimed invention.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

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By: ______________________

Ellen Marcie Emas
Registration No. 32, 131

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620